CLAIMS

What is claimed is:

1. A semiconductor assembly comprising:

a substrate having a surface;

a semiconductor die having a plurality of edges, having an active surface having a plurality of bond pads thereon located adjacent at least two edges of the plurality of edges, and having a back side surface, the semiconductor die having at least a portion of the back side surface adhesively attached to at least a portion of the surface of the substrate;

an encapsulation material covering a portion of the surface of the substrate, the plurality of edges of the semiconductor die, and at least one bond pad located on at least two edges of the semiconductor die; and

a heat sink attached to a portion of the active surface of the semiconductor die.

2. The semiconductor assembly of claim 1, wherein the heat sink includes a plurality of fins thereon.

3. A semiconductor assembly comprising:

a substrate having a plurality of circuits on a portion of a surface thereof;

a semiconductor die having a plurality of bond pads located on an active surface thereof and having a back side surface;

a plurality of solder balls connecting at least a portion of the plurality of bond pads of the semiconductor die to at least a portion of the plurality of circuits of the substrate;

a compliant adhesive filled gel elastomer contacting at least a portion of the back side surface of the semiconductor die; and

a heat sink cap covering the compliant adhesive filled gel elastomer, the semiconductor die, the plurality of solder balls, and a portion of the substrate, the heat sink cap contacting at least a portion of the compliant adhesive filled gel elastomer.

4. The semiconductor assembly of claim 3, wherein the heat sink cap includes a plurality of fins thereon.

5. The semiconductor assembly of claim 3, wherein the compliant adhesive filled gel elastomer includes a cross-linked silicone.

6. A semiconductor assembly comprising:

a substrate having a plurality of electrical connections on a portion of the surface thereof;

at least one semiconductor die having a plurality of bond pads on a first portion of the active surface thereof and having a back side surface, a portion of the back side surface adhesively attached to a portion of the surface of the substrate;

a plurality of wire bonds connecting at least a portion of the plurality of bond pads of the semiconductor die to at least a portion of the plurality of electrical connections of the substrate;

an encapsulant material covering a portion of the surface of the substrate, the plurality of bond pads on the active surface of the semiconductor die, a portion of the active surface of the semiconductor die, and the plurality of wire bonds; and

a heat sink attached to a second portion of the active surface of the semiconductor die.

7. The semiconductor assembly of claim 6, wherein the heat sink includes a plurality of fins thereon.

8. A semiconductor assembly comprising:

a substrate having a surface having a plurality of circuits on a portion thereof;

a semiconductor die having a plurality of bond pads located on a first portion of the active surface thereof and having a back side surface;

a plurality of solder balls connecting at least a portion of the plurality of bond pads of the semiconductor die to at least a portion of the plurality of circuits of the substrate;

a metal filled cross-linked silicone compliant adhesive filled gel elastomer contacting a portion of the back side surface of the semiconductor die; and

a heat sink cap having a portion thereof in contact with a portion of the metal filled cross-linked silicone compliant adhesive filled gel elastomer, the heat sink cap covering the metal filled cross-linked silicone compliant adhesive filled gel elastomer, the semiconductor die, the plurality of solder balls, and at least a portion of the substrate.

9. The semiconductor assembly of claim 8, wherein the heat sink cap includes a plurality of fins thereon.